



TIME LAPSE VIDEO CASSETTE RECORDER

INSTALLATION AND OPERATION MANUAL

MODEL

HS-5424EA

CONTENTS

	Page
CAUTION AND CARE	1-2
CONTROLS AND COMPONENTS	3-4
CONNECTING WITH OTHER EQUIPMENT	5
SETTING THE PRESENT TIME	6-7
USER SELECTION DISPLAY	8-9
LOADING AND UNLOADING THE CASSETTE TAPE	10
MANUAL RECORDING	11-12
TIMER RECORDING	13-14
ALARM RECORDING	15-16
PLAYBACK	17
SPECIAL EFFECTS PLAYBACK	18
ADJUSTMENT DURING PLAYBACK	19
BEFORE CALLING FOR SERVICE	20
SPECIFICATIONS	21

ONLY VIDEO CASSETTE TAPE WITH THE  MARK MAY
BE USED WITH THIS MODEL.

THIS INSTRUCTION MANUAL IS IMPORTANT TO YOU.
PLEASE READ IT BEFORE USING YOUR VIDEO CAS-
SETTE RECORDER.

CAUTION AND CARE

CONDENSATION IS THE ENEMY OF VIDEO RECORDERS

■ WHAT IS CONDENSATION?

1. When a very cold drink is poured into a glass, the water droplets which form on the outer surface of the glass are an example of condensation.
2. If the VCR is exposed to a rapid increase in temperature (such as warming a cold room or after transporting it from a cold location to a warm one) condensation may form on the tape transport mechanism inside the VCR. This VCR is equipped with a heating circuit to dry up the moisture and prevent damage to the VCR or video tape from condensation. To activate the heater, plug the VCR in and switch the VCR POWER to ON. Leave the VCR on for at least 2 hours before using it for record or playback.

■ CONDENSATION IS LIKELY TO OCCUR WHEN:

1. The VCR is moved inside from outdoors, or from a cold room to a warm one.
2. A cold room is heated quickly.
3. Humidity is high.

NOTE:

- Avoid using the VCR where cold air (e.g., from an air conditioner) will blow directly on it.
- Never place anything containing water on top of the VCR, e.g., vases, cups, etc.

HEAVY OBJECT SHOULD NEVER BE PLACED ON THE VCR (E.G., TV)

NEVER TOUCH OR INSERT ANY OBJECT INSIDE THE VCR

Touching the inside of the cabinet or inserting foreign objects of any kind not only creates a safety hazard but can also cause extensive damage.

PROTECT THE MAINS LEAD

Damage to the mains lead may cause fire or shock hazard. When unplugged, hold by the plug only and remove carefully.

UNPLUG THE MAINS LEAD DURING A LONG ABSENCE

Turn off the power and unplug the mains lead during a long absence.

MAINTAIN GOOD VENTILATION

Do not obstruct the many ventilation holes on the VCR. For maximum ventilation, place the unit on a hard level surface only, and ensure it is not covered during use. Heavy objects should never be placed on the VCR.

WHEN NOT IN USE

When you finish operating the VCR always unload the cassette and turn OFF the VCR POWER.

CABINET CARE

Never use petroleum-based cleaners. Clean with a soft cloth moistened with soap and water and wipe dry. PVC cables or leads should not be left in contact with the cabinet surface for long periods.

INSTALLATION LOCATION

For excellent performance and lasting reliability install in location that is:—

1. Well ventilated, out of direct sunlight and away from direct heat.
2. A solid vibration-free surface.
3. Free from high humidity, excessive dust and away from magnetic fields.

NOTE:

- Never move the VCR without first removing the tape.

CARE OF THE VIDEO CASSETTE TAPE

- Avoid violent vibration or shock.
- Do not place near a strong magnetic field (e.g., a motor, transformer or magnet).
- Never place or store in direct sunlight.
- Avoid dusty places.
- Place the cassette in its case and store vertically.
- Never store tape in high humidity.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

THIS UNIT IS PRODUCED TO COMPLY WITH DIRECTIVE 76/889/EEC, 82/499/ECC AND 87/308/EEC, CISPR PUB. 14 AND STANDARD IEC 65.

FEATURES

**Up to 27 hours of continuous recording with audio:
an ideal video system for automated security and surveillance systems.**

This time lapse VCR is designed especially for industrial, educational and studio recording. In addition to ordinary 3-hour recording modes, it has a 15-hour and 27-hour modes. Field-by-field playback and high-speed playback of longer recordings are also available. This adds up to a powerful surveillance system for banks, buildings, traffic and parking lots, as well as a convenient scientific tool for observation of plant growth, animal behaviour and other time-intensive processes.

Automatic head cleaning

For continuous smooth operation, the VCR automatically removes foreign matter on the head when the cassette is inserted.

Easy cueing with indexed recording

Index signals are added automatically at the beginning of "alarm recording" for easy cueing. You can even use the monitor to confirm the starting time of your recording.

Easy setup right on the monitor

Set 5 recording parameters, including date, time and timer, using the monitor. Call your setup to the screen to easily confirm or change your parameters.

Special playback features

These include still images, speed search, reverse playback, field-by-field viewing in both directions, and slow-motion and high-speed viewing, with quick shifts to playback while cueing.

Recording options for varied needs

This versatile system offers a variety of recording options, including daily and weekly timer recording, repeat and alarm recording.

Protection against power failures

Recording data, including date, time and timer setup, are stored in memory, so the system can resume recording after a power failure. The time of the failure is displayed on the monitor.

Tape counter/lap time indicator

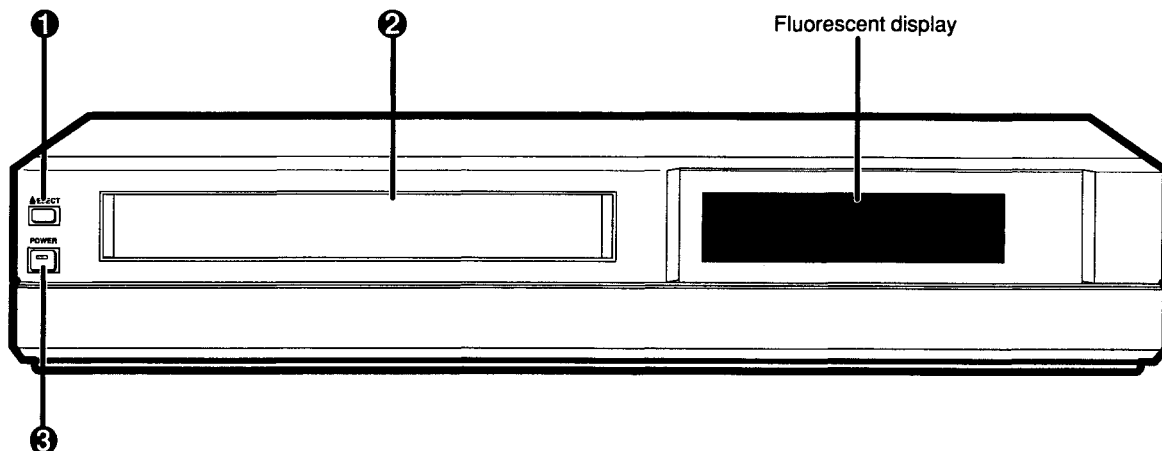
The counter logs tape by time or serial number starting with 00000.

Digital <ELAPSED TIME> display

The Elapsed time of recording and playback is stored in non-volatile memory IC. The digital display is used as guideline for exchange of the head.

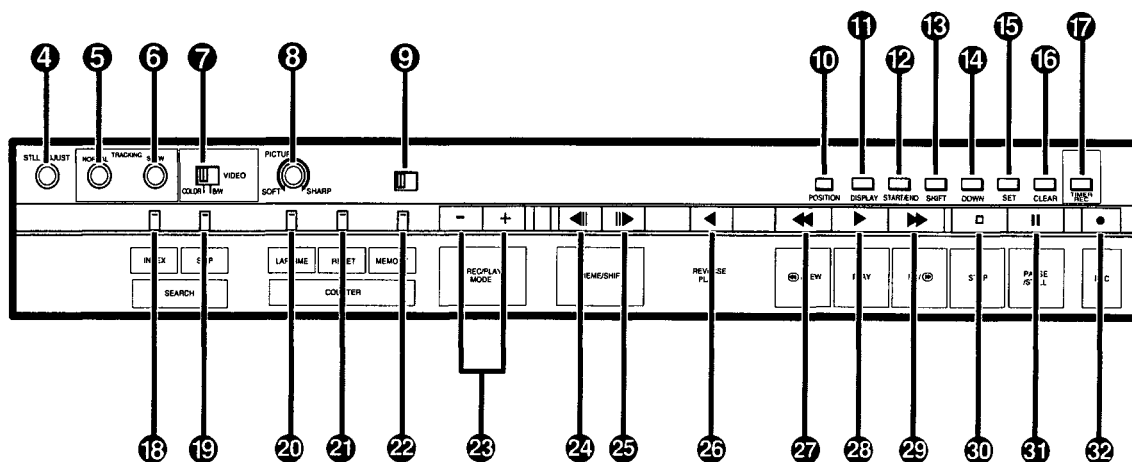
CONTROLS AND COMPONENTS

FRONT VIEW



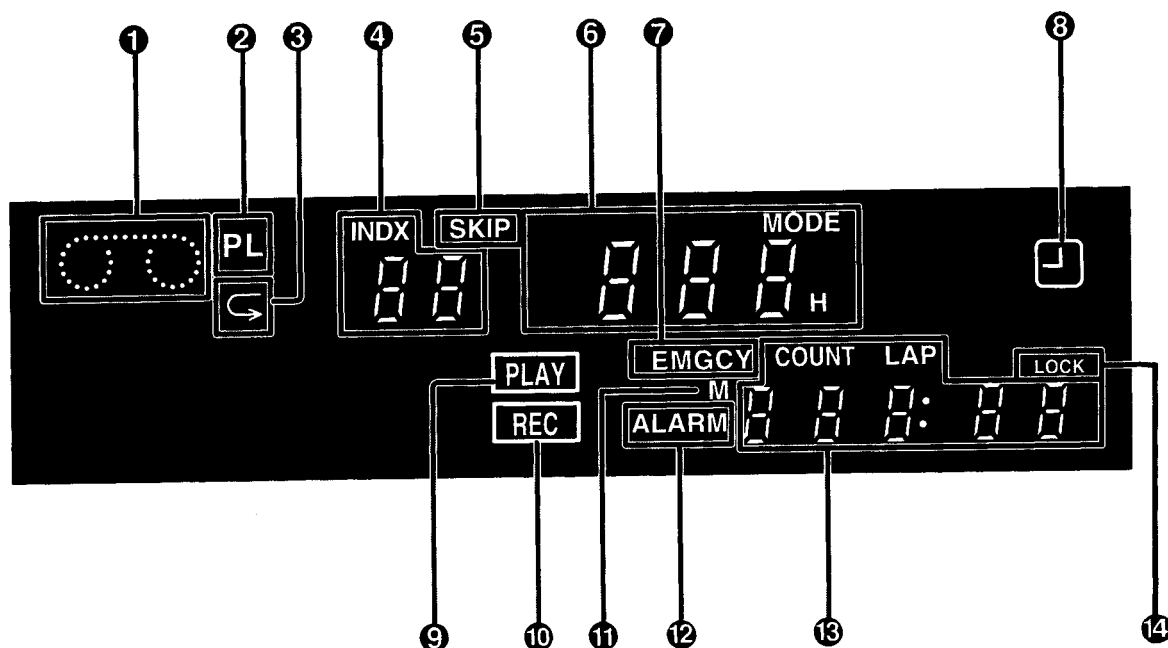
- ① EJECT button
- ② Cassette loading slot
- ③ POWER button

CONTROL PANEL



- ④ STILL ADJUST control
- ⑤ NORMAL TRACKING control
- ⑥ SLOW TRACKING control
- ⑦ VIDEO switch
- ⑧ PICTURE control
- ⑨ LOCK switch
When set to the right (ON), will lock the unit in the current mode.
- ⑩ POSITION button
- ⑪ DISPLAY button
- ⑫ START/END button
- ⑬ SHIFT button
- ⑭ DOWN button
- ⑮ SET button
- ⑯ CLEAR button
- ⑰ TIMER REC button
- ⑱ INDEX SEARCH button
- ⑲ SKIP SEARCH button
- ⑳ LAPTIME button
- ㉑ COUNTER RESET button
- ㉒ COUNTER MEMORY button
- ㉓ REC/PLAY MODE buttons
- ㉔ REVERSE FRAME SHIFT button
- ㉕ FORWARD FRAME SHIFT button
- ㉖ REVERSE PLAY button
- ㉗ REW button
- ㉘ PLAY button
- ㉙ FF button
- ㉚ STOP button
- ㉛ PAUSE/STILL button
- ㉜ REC (RECORD) button

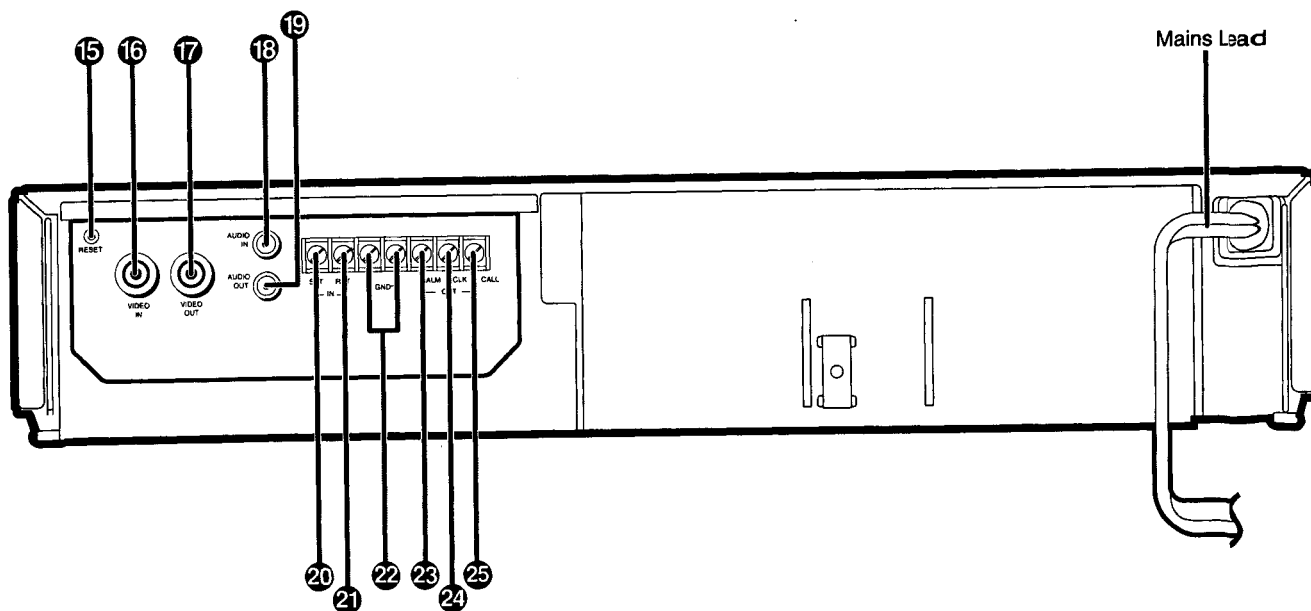
FLUORESCENT DISPLAY



- 1 Cassette status indicator
- 2 PL (POWER LOSS) indicator
- 3 REPEAT indicator
- 4 INDX (INDEX) indicator
- 5 SKIP indicator
- 6 Recording and playing back mode display
- 7 EMGCY (EMERGENCY REC) indicator

- 8 TIMER REC indicator
- 9 PLAY indicator
- 10 REC indicator
- 11 M (COUNTER MEMORY) indicator
- 12 ALARM indicator
- 13 Counter and lap time display
- 14 LOCK indicator

REAR VIEW



- 15 RESET button
- 16 VIDEO IN connector
- 17 VIDEO OUT connector
- 18 AUDIO IN connector
- 19 AUDIO OUT connector
- 20 SET IN terminal

- 21 RST (RESET) IN terminal
- 22 GND (GROUND) terminals
- 23 ALM (ALARM) OUT terminal
- 24 CLK (CLOCK) OUT terminal
- 25 CALL OUT terminal

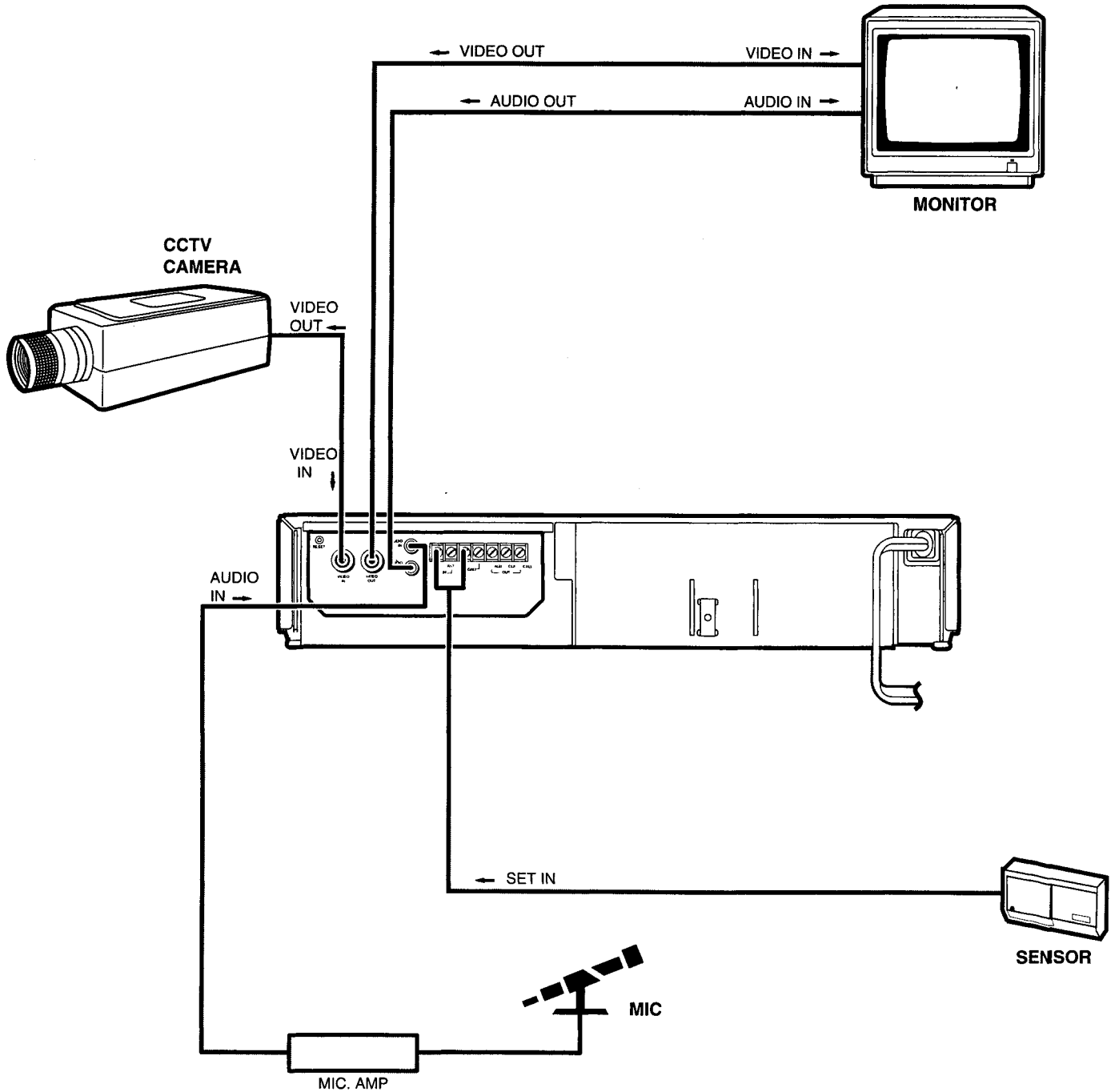
NOTE:

- The VCR may function abnormally if you connect the rear terminals with the Mains Lead plugged. Make sure to connect them after unplugging the Mains Lead.

CONNECTING WITH OTHER EQUIPMENT

■ When connecting general use "CCTV CAMERA" to the "MONITOR".

There may be vertical movement or bending at the top on some monitor, In this case, the VCR should not be considered a malfunction.



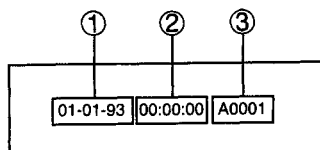
ENGLISH

SETTING THE PRESENT TIME

ACCURATELY PRE-SET THE DATE AND PRESENT TIME BEFORE TIMER PROGRAMMING.

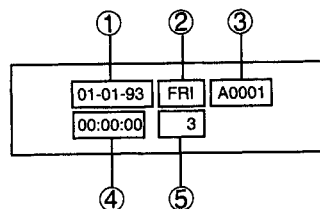
<DATE LINE 1LINE>

- ① Day-Month-Year
- ② Hour: Minute: Second
- ③ Alarm recording number



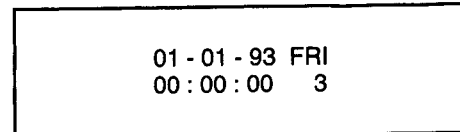
<DATE LINE 2LINE>

- ① Day-Month-Year
- ② A day of week
- ③ Alarm recording number
- ④ Hour: Minute: Second
- ⑤ Recording mode

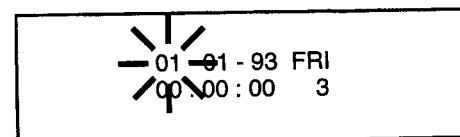


- A 24-hour display is used. 00:00 indicates midnight; 12:00 midday and 15:00 3 o'clock in the afternoon.
- The day of the week automatically sets.
- The alarm recording number display is shown during alarm recording.

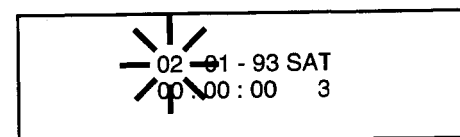
① Press the DISPLAY button to show Day and present time display on the monitor.



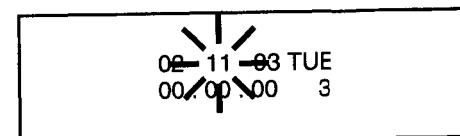
② Press the START/END button.
("Day" display flashes.)



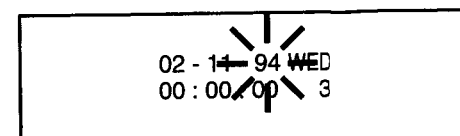
③ **Setting the day**
Press the SET button to set the day.



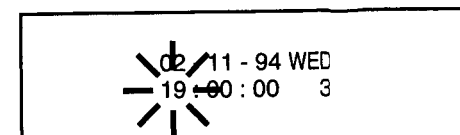
④ **Setting the month**
Press the SHIFT button to flash the "Month" display. Press the SET button to set the month.



⑤ **Setting the year**
Press the SHIFT button to flash the "Year" display. Press the SET button to set the year.
• The year digits can be set to 1993-2023.



⑥ **Setting the present time**
Press the SHIFT button to flash the hour digits of "Present time" display. Press the SET button to set the hour digits of the present time.
• When the SHIFT button is pressed, the flashing display moves.
• If necessary, similarly set the 10 minutes digit and minute digit.



⑦ Press the START/END button.
(Flashing display stops.)

NOTE:

- The flashing of the display automatically stops after 3 minutes after pressing the SHIFT or SET button.
- If the display continues to flash, the clock will not advance. Press the START/END button and confirm that the display has stopped flashing.
- The POWER button and the DISPLAY button can not operate when the display continues to flash.

■ SETTING THE PRESENT TIME TO THE EXACT SECOND

Set the clock as described above, but set the minutes one or two minutes ahead of the reference time being used. When the reference time reaches 00 seconds of the minute you have chosen, press the START/END button. The VCR time now corresponds to the reference time to the nearest second.

POSITION button

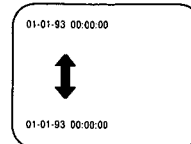
<DATE LINE 1LINE>

Whenever pressed, date and present time display will move up-and-down on the monitor.

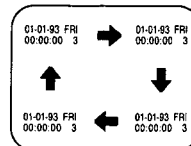
<DATE LINE 2LINE>

Whenever pressed, date, present time display and recording mode display will transfer to the four corners of the monitor.

<DATE LINE 1LINE>



<DATE LINE 2LINE>



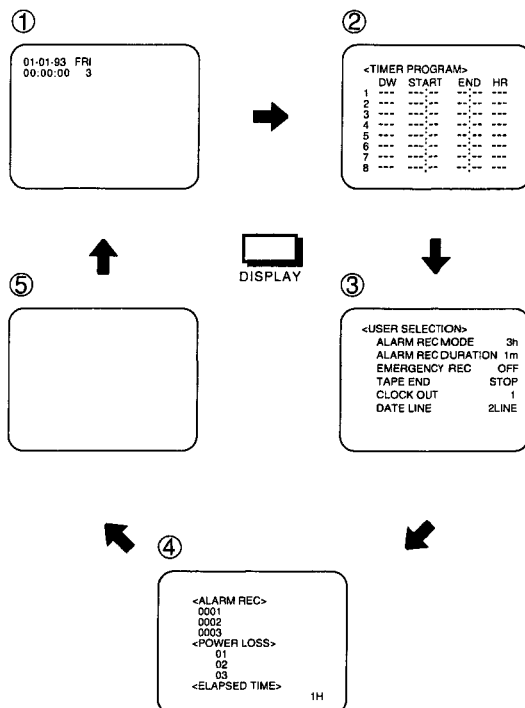
DISPLAY button

The display on the monitor changes each time this button is pressed.

- ① Day and present time display
- ② Timer recording time setting display
- ③ User selection display
- ④ Alarm recording list/Power failure time list/Elapsed time of recording and playback display
- ⑤ Display off

NOTE:

The <ELAPSED TIME> display is used as guideline for exchanging of the head.



RESET button

When this VCR is not properly operated or in case of an abnormal display, press the RESET button located on the rear panel using a pencil or a ballpoint pen. This will cut the power, erase all previous settings and return the machine to the original starting up condition. When the condition is restored, reset the current time, then set the timer recording, etc. once again.

USER SELECTION DISPLAY

This VCR can be set the operating environment of through the user selection display.

<USER SELECTION>		
ALARM REC MODE	3h	
ALARM REC DURATION	1m	1. SETTING THE ALARM RECORDING PERIOD
EMERGENCY REC	OFF	2. SETTING THE EMERGENCY RECORDING
TAPE END	STOP	3. SETTING THE OPERATION AT THE TAPE END
CLOCK OUT	1	4. SETTING THE FREQUENCY DIVISION RATIO
DATE LINE	2 LINE	5. SETTING THE DATE LINE

1. SETTING THE ALARM RECORDING PERIOD (ALARM REC DURATION)

Sets the duration of the alarm recording period. When the SET button is pressed, the display will be switched in the order of 1m (minute) → 2m → 5m → 10m → MAN (MANUAL) → 15s (second) → 30s → 45s → 1m →

2. SETTING THE EMERGENCY RECORDING (EMERGENCY REC)

Sets the emergency recording mode.

OFF: Starts alarm recording when the alarm signal is entered during recording.

ON: Starts alarm recording when the alarm signal is entered not only during recording but also when the power is OFF or when the tape is stopped.

3. SETTING THE OPERATION AT THE TAPE END (TAPE END)

Sets the operation of the VCR when the tape goes out during the recording.

STOP: The tape stops.

Outputs the CALL signal at the tape end.

REWIND: Rewinds the tape to the beginning and stops. (Except during timer recording.)

Outputs the CALL signal during 2 seconds at the tape end.

REPEAT: Rewinds the tape to the beginning and resumes the recording.

ALARM-PROT: Stops the tape at its end when there is an alarm during recording.

(ALARM PROTECT) Rewinds the tape and resumes recording when there is no alarm during recording.

4. SETTING THE FREQUENCY DIVISION RATIO (CLOCK OUT)

Sets the frequency division ratio of clock pulse output from the CLOCK terminal. When the SET button is pressed, the display will be switched on in the order of 1 → 2 → 3 → 4 → 5 → 10 → 15 → 20 → 25 → 30 → 50 → 60 → FIELD → 1 →

The numbers 1 to 60 indicate the number of frames in the continuous recording mode or the number of fields in time lapse recording mode. (One frame consists of two fields.)

5. SETTING THE DATE LINE (DATE LINE)

Sets the date line mode. When the SET button is pressed, the display will be switched in the order of 2 LINE → 1 LINE → 2 LINE →

1 LINE: Displays date, and present time.

2 LINE: Displays date, day of the week, present time, and recording mode.

To operate the VCR with the on-screen display shown on the monitor:

① Press the DISPLAY button to show <USER SELECTION> display on the monitor.

② Press the START/END button.
(Setting position of ALARM REC DURATION flashes.)

③ Press the DOWN button to select the desired function.

④ Press the SET button to select the desired mode.
• When setting other functions, repeat steps ③ and ④.

⑤ Press the START/END button.
(Flashing display stops.)

NOTE:

- The flashing of the display automatically stops after 3 minutes after pressing the DOWN or SET button.
- The POWER button and the DISPLAY button cannot operate when the display continues to flash.

<USER SELECTION>
ALARM REC MODE 3h
ALARM REC DURATION 1m

<USER SELECTION>
ALARM REC MODE 3h
ALARM REC DURATION 1m

<USER SELECTION>
ALARM REC MODE 3h
ALARM REC DURATION 5m

<USER SELECTION>
ALARM REC MODE 3h
ALARM REC DURATION 5m

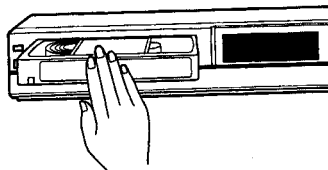
LOADING AND UNLOADING THE CASSETTE TAPE

Video cassette tapes can be loaded into your new VCR as long as the VCR is plugged into a power source. Even if the VCR power switch is turned off, loading a cassette will automatically cause it to turn on. Use only video cassette tapes marked **VHS**.

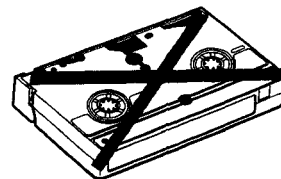
Use only standard tapes for VHS cassette tapes to ensure reliable video recording. Please do not use: Pro; Hi-Fi and High Grade or E-240 tapes as damage to recording heads will occur.

LOADING

- 1 To position the cassette properly before inserting it in the cassette slot, hold the cassette so that the long narrow edge with the contents label faces towards you. The other long narrow edge is hinged and should face towards the VCR. The clear plastic window that shows the video tape should face upward.
- 2 Gently insert the videotape into the cassette slot to the point that your VCR automatically retracts the cassette.
 - When you insert the video tape, be sure to orient it squarely to the slot.



CORRECT



INCORRECT

NOTE:

Your new VCR has a protection circuit which will eject the tape if it is loaded improperly. If the VCR ejects the tape you are trying to load, remove it completely and check that the long narrow edge with the contents label is facing towards you and that the clear plastic window that shows the video tape is facing upwards. Then try again.

UNLOADING

- 1 Press the EJECT button on the front of the VCR.
- 2 Remove the cassette.

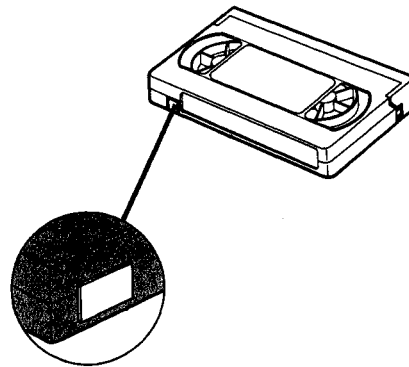
Your VCR will eject a video cassette even if the power to the VCR is turned off (as long as the VCR is plugged into an outlet). When the EJECT button is pressed, the VCR will automatically turn on, eject the tape, and turn off. However, in the recording mode, it is not possible to eject a tape without first pressing STOP, on the front panel of the VCR and then pressing EJECT.

PREVENTING ACCIDENTAL ERASURE

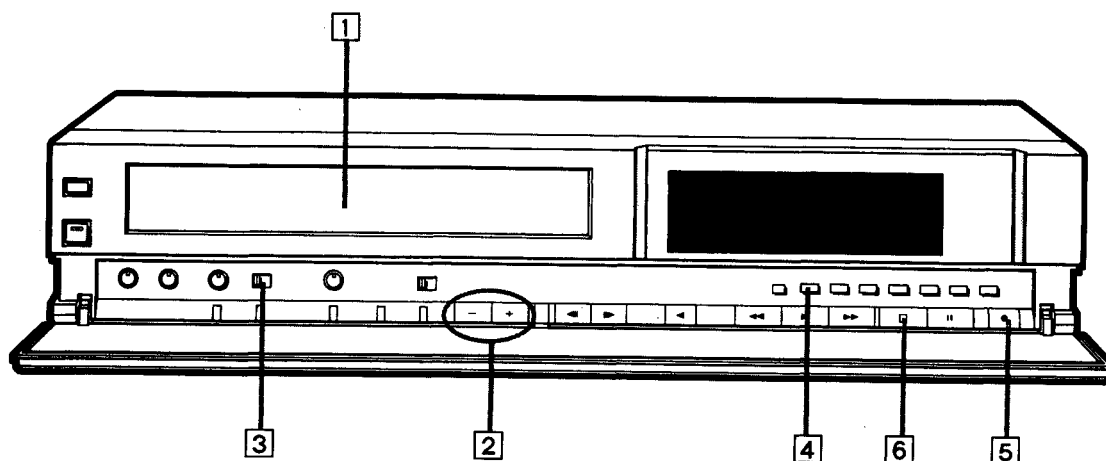
Video cassettes come with a tab which, when removed, prevents the tape's contents from being erased, or recorded over. If the cassette you insert in your VCR has the erasure prevention tab removed, your VCR will automatically eject it if you attempt to record on it.

NOTE:

- We recommend that any torn or broken cassette tape requiring repair be taken to professionals who specialize in such procedures. The adhesives on many common types of tape could damage the head of your VCR.
- To record over the tape that has had the erasure prevention tab removed, simply place a piece of vinyl tape over the gap.



MANUAL RECORDING



- 1 Load a cassette with the erasure prevention tab intact.
- 2 Press the REC/PLAY MODE buttons to select the desired recording mode.
- 3 Select the VIDEO switch setting according to the type of image to be recorded, COLOR or B/W.
 - Do not connect the colour and black & white cameras together.
- 4 To record the date and present time, press the DISPLAY button to display the date and present time on the monitor.
- 5 Press the REC button to begin recording.
- 6 Press the STOP button to stop recording.

NOTE:

- Press the PAUSE/STILL button to momentarily stop recording. Press again to resume recording.
- To protect the tape, the pause mode is automatically released after about 5 minutes.
- The REC button will function if the tape is in the stop or pause mode.
- When a tape with the erasure prevention tab removed is inserted pressing the REC button will eject the cassette automatically.
- A tape recorded by this VCR may not be played back correctly by another VCR.

AUDIO RECORDING

Apply the specified line input signal to the AUDIO IN connector.

NOTE:

- There is normal sound playback only when the tape recorded in the 3H-L27H modes are played back in the respective modes.

LOCK MODE

When the lock switch is set to the right, the control buttons will not operate and the unit is kept in the current mode. To release the lock mode, set this switch to the left side.

REPEAT RECORDING

When the "TAPE END" of the <USER SELECTION> display is set to "REPEAT" or "ALARM-PROT" and the REPEAT indicator is illuminated, the tape will automatically be rewound to the start after the tape end is reached and recording will start again.

■ WHEN TAPE END IS REACHED

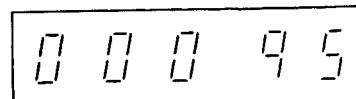
The following functions are automatically engaged when tape ends during recording.

	STOP	REWIND	REPEAT	ALARM-PROT
When there is alarm recording during the recording.	The tape stops.	The tape is rewound automatically to its beginning and then stops. (Tape end can be confirmed from a distance by connecting an alarm panel or buzzer to the CALL terminal on the rear panel.)	The tape is rewound automatically to its beginning and then the recording is resumed.	The tape stops.
When there is no alarm recording during the recording.				The tape is rewound automatically to its beginning and then the recording is resumed.

TAPE COUNTER

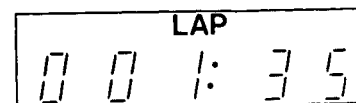
An illuminated digital display which provides a five digit numerical indication of the relative position on the tape.

- "EEE EE" illuminates to indicate that the VCR power is turned off.



LAP TIME

The amount of tape consumed will be indicated in time. When the LAPTIME button is pressed the counter display will change to lap time display and show elapsed time from read-out "00000". (At this time the display will have "LAP" illuminate.) When the counter is reset to "00000" by pressing the COUNTER RESET button at the beginning of the tape, it is very convenient to check the remaining time of the tape.

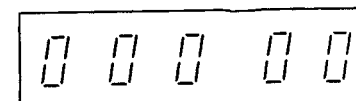


When the REC/PLAY mode has been set, a calculated time will be displayed.

- The counter display will return on the fluorescent display when fast-forward, rewind or playback starts.
- The LAP indicator will show "---:--" when the counter read-out is over 11880. In this case, press the COUNTER RESET button.

COUNTER RESET

Press the COUNTER RESET button and the counter will be reset to "00000".



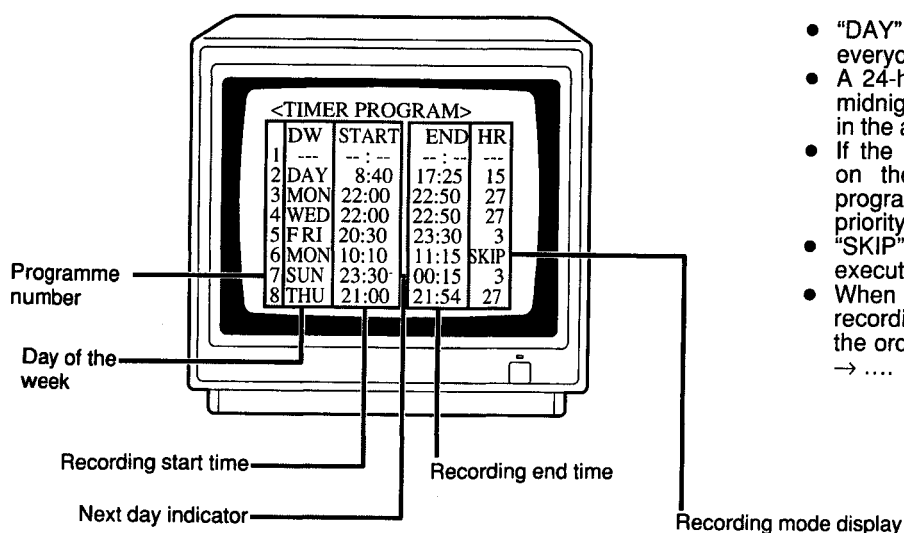
COUNTER MEMORY

When the COUNTER MEMORY button is pressed, the tape will be rewound to the "00000" position of the counter and stop. (The rewind position is slightly inaccurate.)

NOTE:

- The counter display is stored in the memory when the power is turned off, so the same numbers will be displayed when the power is turned back on.

TIMER RECORDING



- "DAY" is used for the same time recording everyday.
- A 24-hour display is used. 00:00 indicates midnight; 12:00 midday and 15:00 3 o'clock in the afternoon.
- If the recording times of two programmes on the same time overlap, the higher programme recording number is given priority.
- "SKIP" indicates that recording can not be executed.
- When the SET button is pressed, the recording mode display will be switched in the order of SKIP → 3 → 15 → 27 → SKIP →

1 Press the DISPLAY button to show timer setting display on the monitor.

2 Press the START/END button.
(The day of the week display flashes.)

3 **Setting the day of the week (DW)**
Press the SET button to set the day of the week.

4 **Setting the recording start time (START)**
Press the SHIFT button to flash the recording start time display.
Press the SET button to set the recording start time.

5 **Setting the recording end time (END)**
Press the SHIFT button to flash the recording end time display.
Press the SET button to set the recording end time.

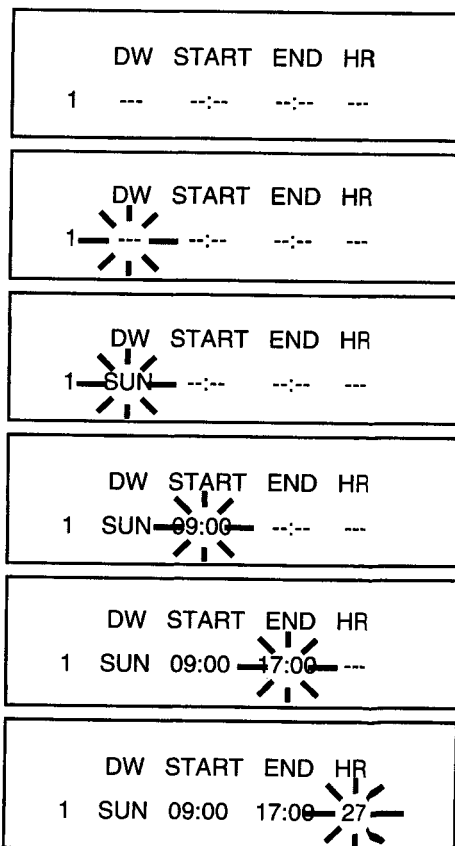
6 **Setting the recording mode (HR)**
Press the SHIFT button to flash the recording mode display.
Press the SET button to set the recording mode.

- When the SHIFT button is pressed, the flashing display moves on to the next, and when the SET button is pressed, the flashing position can be set.
- If the END time is the same or earlier than the START time, the next day indicator (•) is automatically displayed. This indicates that the recording will run continuously from the START time on the first day to the END time on the next day.
- When setting another programme, press the DOWN button and repeat step 3 - 6.
- To erase the programmed resetting, press the DOWN button to select the programme number to be erased and press the CLEAR button.

7 Press the START/END button.
(Display stops flashing.)
If programme has not been set completely, the flashing will not stop.

8 Press the DISPLAY button to show day and present time display on the monitor.

9 Press the TIMER REC button.
(TIMER REC indicator is illuminated.)



IN ORDER TO AVOID MIS-SETTING OF THE TIMER

When any mis-setting is involved when pressing the TIMER REC button, unavailability of recording is indicated by the following.

Symptom	Condition	Procedure
TIMER REC indicator flashes.	• A Tape is not inserted. • A Tape with the erasure prevention tab removed is loaded. • Date, time or timer recording time is not set. • User selection display is being set.	1. Press the TIMER REC button. 2. Cancel the fault conditions as shown left. 3. Press the TIMER REC button and confirm that the TIMER REC indicator (□) is illuminated.

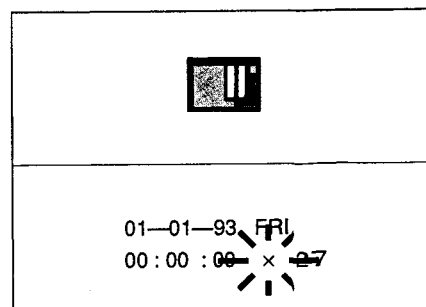
MEMORY/BACKUP IN CASE OF POWER FAILURE

This VCR includes a built-in memory back-up, so the presettings will remain in the memory even if there is a power failure or the MAINS LEAD is disconnected. (The memory back-up is automatically charged when the MAINS LEAD is connected. The presettings will remain in the memory for a maximum of 7 days.)

The time may suffer some change when there is a power failure or if no power is supplied. It is best to check the present time if the power is out or if the MAINS LEAD is disconnected for a long time.

RECORDING AFTER A POWER FAILURE

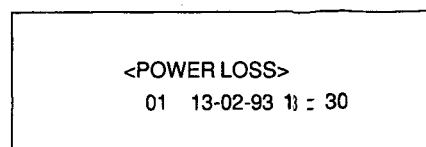
If the LOCK switch is set to the right (ON) (Refer to page 3) when there is a power failure, the unit will be set to the recording mode when the power comes back on. If there is a power failure during timer recording or alarm recording, the unit will be set to the recording mode when the power comes back on regardless of the position. "X" will be displayed for about 1 minute next to the present time display on the monitor when the power comes back on.



POWER FAILURE TIME DISPLAY

The power failure start time is stored in memory so it is possible to confirm the start times while recording. Press the DISPLAY button to show the alarm recording list/power failure time list display.

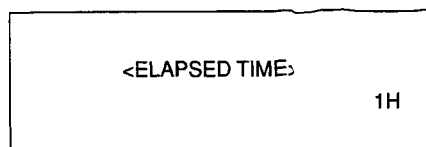
- The POWER FAILURE time will be stored in memory for 3 recordings. For more than 3 recordings, the first and the last 2 power failure start times will be displayed.
- Pressing the CLEAR button with the alarm recording list/power failure time list display appearing on the screen will erase the power failure time.



ELAPSED TIME DISPLAY

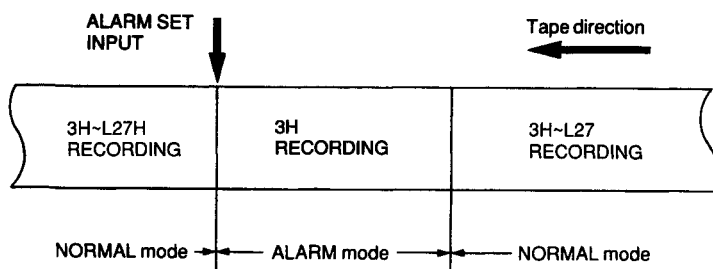
The ELAPSED time of recording and playback is stored in memory. The digital display is used as guideline for exchange of the head. Press the DISPLAY button to show the Elapsed time display.

- The displayed time is approximate.
- The Elapsed time is counted up to 10,000 hours.



ALARM RECORDING

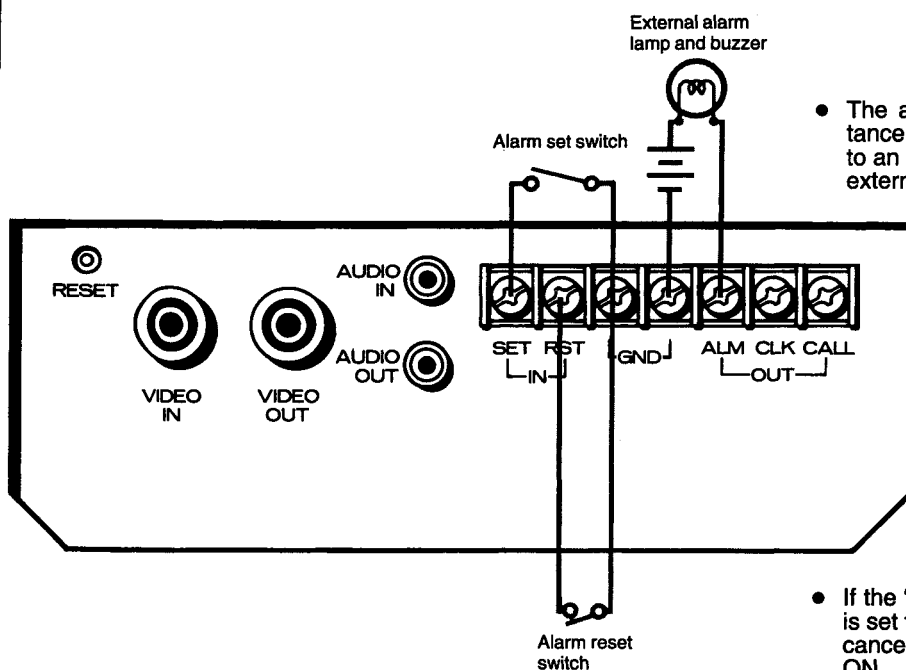
IT IS POSSIBLE TO SWITCH FROM ALL RECORDING MODES TO THE 3H RECORDING MODE BY APPLYING AN ALARM SIGNAL TO THE SET TERMINAL ON THE REAR PANEL.



- It is possible to switch to the alarm mode (3H) and record the status in detail by applying the set signal from the alarm sensor during recording in the NORMAL mode (3H~L27H).

- The index signal is automatically recorded when alarm recording begins.
- During recording the index signal (15 seconds), the next SET signal will not be received.

ALARM RECORDING CONNECTION



- The alarm can be confirmed from a distance by connecting the "alarm out" switch to an existing alarm system panel or other external devices such as a buzzer.

- If the "ALARM REC DURATION" of the user selection is set to "MAN" after recording starts, recording can be canceled any time by turning the alarm reset switch ON.

SETTING THE ALARM RECORDING

You must set the alarm recording state, before executing alarm recording. Press the DISPLAY button to show the user selection display.

■ SETTING THE ALARM RECORDING PERIOD

Set the period during which alarm recording is to be executed when the alarm signal is entered. (15 seconds to 10 minutes and manual (MAN)). Recording is continued until the entry of the signal in the RST IN terminal when the "ALARM REC DURATION" of the user selection display is set to "MAN".

<USER SELECTION>	
ALARM REC MODE	3h
ALARM REC DURATION	5m

■ During alarm recording, the alarm recording count will automatically be displayed.

- The Alarm recording count display counts alarms from 0000 to 9999 and then is reset to 0000 and continues counting.
- Press the CLEAR button during the alarm recording list/power failure time list display shown, the alarm recording count display will be reset.

NOTE:

- If the set signal is applied during alarm recording, a new alarm recording will start at the new time.
- Alarm recording will be continued during the alarm time which has been set even if the timer recording end time is reached.
- Alarm recording is released when the tape end is reached.
- The alarm indicator flashes during alarm recording and lights up when the alarm recording is finished.
- When the alarm recording is finished, the VCR resumes previous mode.

EMERGENCY RECORDING

This function automatically starts alarm recording when the set signal is applied, even when the VCR is not recording. If the "EMERGENCY REC" of the user selection display is set to "ON", alarm recording starts automatically when the signal is applied to the SET IN terminal in recording mode and in stop mode (including timer recording stand-by mode). (If it is set to "OFF", alarm recording is started only when the VCR is in recording mode).

- "EMGCT" lights up on the fluorescent display when the "EMERGENCY REC" of the user selection display is set to "ON".

ALARM RECORD TIME DISPLAY

The Alarm record start time is stored in memory so it is possible to confirm the start times while recording. Press the DISPLAY button, and the alarm recording list/power failure time list display will appear on the screen.

- The Alarm record start times will be stored in memory for up to 3 times. For more than that, the first and the last 2 Alarm record start times will be displayed.
- Pressing the CLEAR button with the alarm recording list/power failure time list display appearing on the screen will erase the Alarm record time.

<ALARM REC>			
0001	02-10-93	06:30	3
0002	02-15-93	23:00	3
0003	02-28-93	17:00	3

- Alarm recording mode

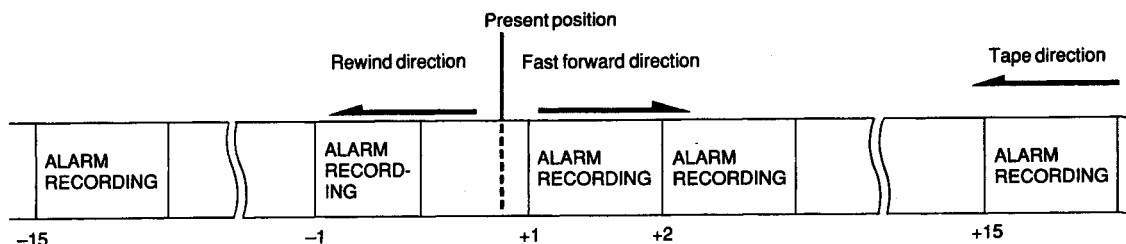
LOCATING THE START OF ALARM RECORDED PROGRAMMES

This machine automatically inserts an index signal at the beginning of each ALARM RECORDING allowing the start of each alarm to be located.

INDEX SEARCH

During fast forwarding or rewinding the machine will search for index signals. Where an index signal is set the machine will stop and begin still playback.

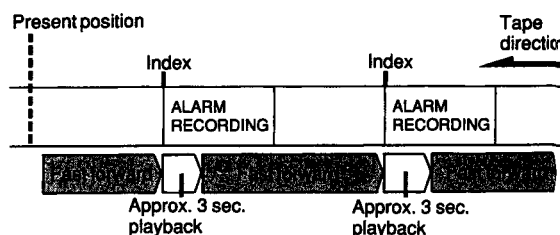
- 1 Press the INDEX SEARCH button to set the number of times to correspond to the alarm index you desired to locate. (1 through 15)
(On the fluorescent display "INDX" will be illuminated and the number indication will be illuminated.)
- 2 Press the FF button or the REW button.
(The programme indication number will decrease one by one as each index signal goes by.)



SKIP SEARCH

This allows you to view about 3 seconds of the beginning of each ALARM RECORDING to find a particular alarm recording.

- 1 Press the SKIP SEARCH button.
(On the display "SKIP" will be illuminated.)
- 2 Press the FF button or the REW button.



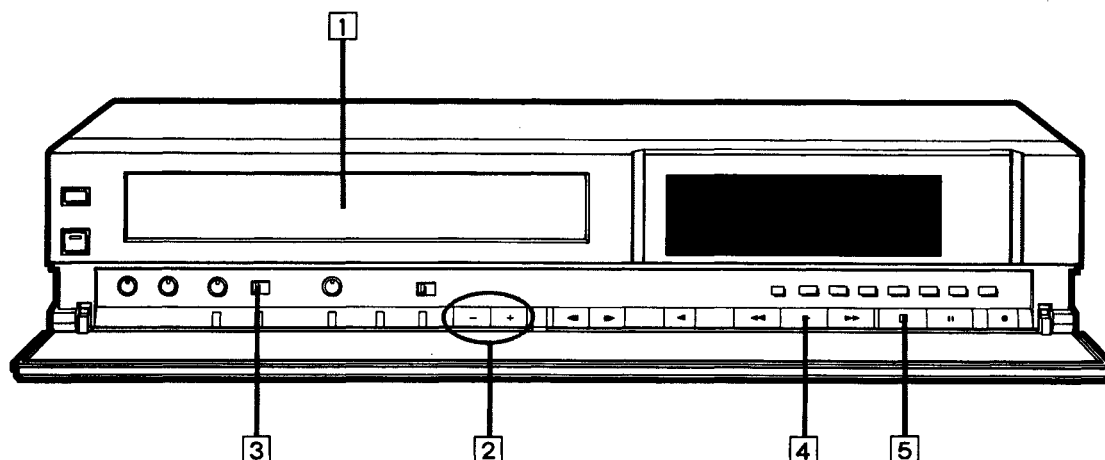
Until the index signal is located the machine will fast advance (or rewind). When an index signal is located the machine will play back (at 3H mode) for about 3 seconds of the programme. This process will be repeated until the end of the tape is reached.

- When the desired programme is located, press the PLAY button.
- To stop SKIP SEARCH, press the STOP button.

NOTE:

- The index signal may be impossible to locate in some recording conditions.

PLAYBACK



- 1 Load a pre-recorded tape.
AUTO PLAY:
If a cassette with the erasure prevention tab removed is loaded the unit automatically switches to play mode and playback begins.
- 2 Press the REC/PLAY MODE buttons to select the desired playback mode.
- 3 Select the VIDEO switch setting according to the type of video signal to be played back, COLOR or B/W.
- 4 Press the PLAY button to start playback.
- 5 Press the STOP button to stop playback.
- Rewind — with VCR in stop mode.
Press the REW button to rewind the tape.
- Fast Forward — with VCR in stop mode.
Press the FF button to run the tape forward at fast speed.

■ PLAYBACK MODE

When the REC/PLAY MODE button is pressed, the playback mode is switched in the order of 3H → L15H → 15H → L27H → 27H → 3H

■ AUDIO PLAYBACK

Playback mode	3H	L15H	15H	L27H	27H
Audio playback	Available	Available	Not available	Available	Not available
Picture quality	Good	Vibrating	Less vibrating	Vibrating	Less vibrating

The modes with the letter "L" (L15H and L27H) are for audio recording and playback on the linear track.

NOTE:

- There is normal sound playback only when the tape recorded in the 3H-L27 modes is played back in the respective modes.
- If in a PLAYBACK mode higher than the one in which it was recorded, it will be in slow motion, and if in a lower PLAYBACK mode, it will be fast.
- The picture may move up/down or noise may occur when the tape is played back in the L15 or L27 mode (even if the tape has been recorded in the L15 or L27 mode).

■ When tape end is reached

The following functions are automatically engaged when tape end is reached during playback or fast forward.

Tape End Selected	"REPEAT" or "ALARM-PROT"	"STOP" or "REWIND"
Playback	The tape automatically rewinds to the Beginning and Stops.	Stop
Fast forward	Stop	Stop

SPECIAL EFFECTS PLAYBACK

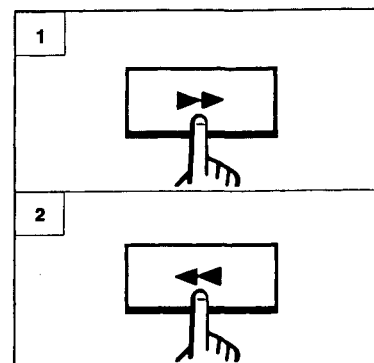
THE AUDIO OUTPUT IS MUTED DURING SPECIAL EFFECTS PLAYBACK.

SPEED SEARCH

- 1 Press the FF button during playback to operate forward speed search.
Press the PLAY button to restore normal playback.
- 2 Press the REW button during playback to operate reverse speed search.
Press the PLAY button to restore normal playback.

NOTE:

- Noise bars will appear on the picture during speed search operation.

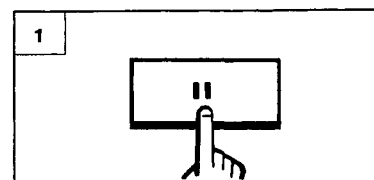


STILL

- 1 Press the PAUSE/STILL button during playback to obtain a still field.
Pressing the button again restores normal playback.

NOTE:

- The still field is released after 5 minutes to prevent damage to the tape.
- If noise appears in the picture during still field playback, press and hold the FORWARD FRAME SHIFT button and adjust the SLOW TRACKING control to achieve the best picture.

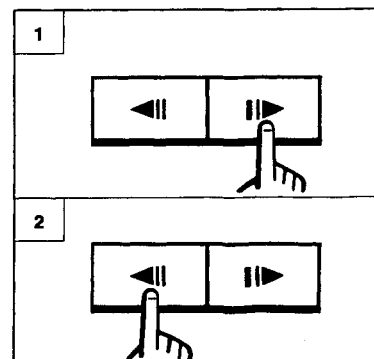


FIELD-BY-FIELD PLAYBACK

- 1 In still field, press the FORWARD FRAME SHIFT button and release to advance one field at a time.
- 2 In still field, press the REVERSE FRAME SHIFT button and release for reverse field-by-field playback.

NOTE:

- When switching the direction, noise bars may appear on the picture.
- A few noise bars or vertical movement may appear during field-by-field playback.

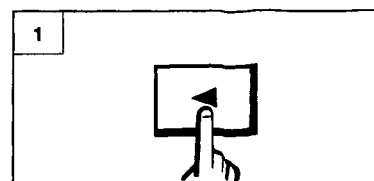


REVERSE PLAYBACK

- 1 Press the REVERSE PLAY button to obtain reverse playback.

NOTE:

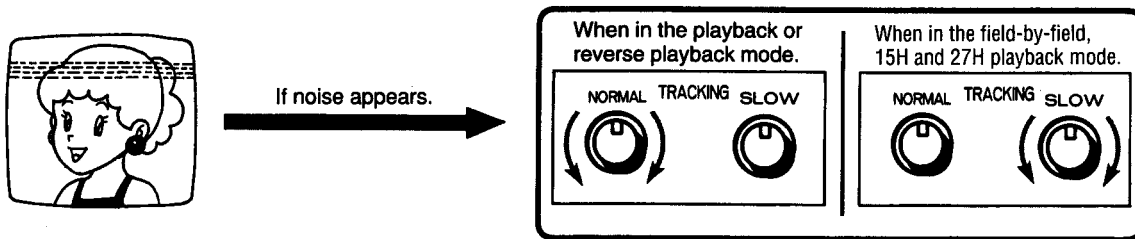
- With tapes recorded in 3H, L15H or L27H mode, the reverse playback in 3H mode will be obtained.
- Noise bars will appear on the picture during reverse playback operation.



ADJUSTMENT DURING PLAYBACK

TRACKING ADJUSTMENT

If noise appears in the picture during playback or reverse playback, adjust the TRACKING control to achieve the best picture.

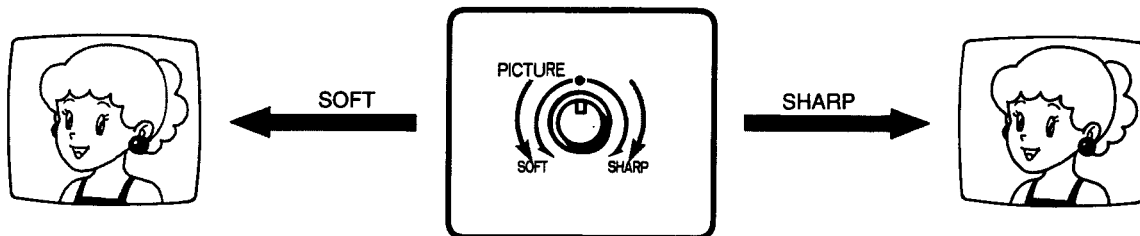


NOTE:

- Remember to return the controls to their click-stop position after use.
- When in the reverse playback mode, a little noise may remain on the screen.
- A few noise during playback in L15H or L27H mode cannot be corrected with TRACKING control.

PICTURE QUALITY ADJUSTMENT

This control allows you to adjust the playback picture so that the outline is sharper or softer.

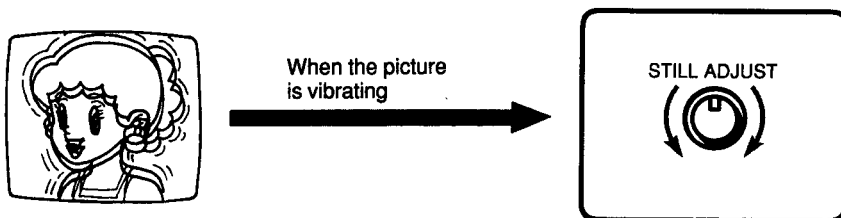


NOTE:

- This control is only effective during playback.

STILL ADJUSTMENT

When watching a still or slow-motion playback, the picture may vibrate at the top and bottom. In this case, rotate the STILL ADJUST control to reduce or eliminate the picture vibration.



NOTE:

- Side to side vibration cannot be corrected with the STILL ADJUST control.
- Vibration during playback in L15H or L27H mode cannot be corrected with the STILL ADJUST control.

BEFORE CALLING FOR SERVICE

Symptom	Remedy
No power supplied to VCR.	- Is the lock switch set to the right side (ON)? - Has the Power Cord been disconnected from the AC outlet? - Is the TIMER REC indicator illuminated?
The VCR POWER is ON but unit does not operate.	- Is the lock switch set to the right side (ON)? - Safety devices are operating. Press the RESET button on the rear panel using a ball point pen.
No picture is obtained on the MONITOR screen.	Is the connecting cable properly connected, or is the cable defective?
No operation when any tape operation button is pressed.	- Is the lock switch set to the right side (ON)? - Is a cassette inserted?
Recording does not work.	- Is the lock switch set to the right side (ON)? - Has the cassette's erasure prevention tab been broken off? - Has the tape run out?
Recording cannot be stopped by pressing the STOP button.	- Is the lock switch set to the right side (ON)? - Is the TIMER REC indicator illuminated?
Timer recording does not operate.	Have the present time and recording time been set accurately?
No operation when PLAY button is pressed.	- Is the lock switch set to the right side (ON)? - Has the tape run out? - Is a cassette inserted?
Noise in the picture during playback.	Has the TRACKING control been adjusted?
The picture vibrates at the top and bottom when in still field mode.	Has the STILL ADJUST control been adjusted?
Clear camera pictures during recording but during playback the picture is not clear.	This symptom may occur when the recorder has been used for a long period of time. During this time, a deposit of oxide has built up on the video heads which must now be cleaned. Do not attempt to clean the video heads, as improper head cleaning procedures may irreparably damage the video heads. Contact your dealer.

SPECIFICATIONS

Tape format: VHS 1/2" width high-density video cassette tape.
 Power Source: AC 230V $\pm 10\%$, 50 Hz
 Power Consumption: Approx. 25 watts.
 Television System: EIA standard 625 lines, 50 fields PAL-type color system
 Video Recording System: 4 rotary heads, azimuth helical scanning system.
 Luminance Signal: Frequency modulation recording.
 Colour Signal: Low frequency conversion, sub-carrier phase shift recording.
 Audio Track: 1 track.

Time (with E-180 cassette):	Mode	Time	Speed	Video signal	Audio signal	Tape drive
	3H	3hrs	23.39mm/sec	Continuous	Recordable	Continuous
	L15H	15hrs	4.68mm/sec	Time lapse	Recordable	Continuous (Slow)
	L27H	27hrs	2.56mm/sec	Time lapse	Recordable	Continuous (Slow)

Fast Forward/Rewind Time: Approx. 3 min with E-180 cassette.

Heads-Video: 4 rotary single crystal heads.

Audio/Control: 1 stationary head.

Erase: 1 full-track head.

Motors: 3 motors-drum/capstain direct drive system.

Video Input: 0.5 - 2.0 Vp-p, 75 ohm BNC plug.

Audio Input: -8 dBs, 50k ohm, RCA plug.

Video Output: 1.0 Vp-p, 75 ohm BNC plug.

Audio Output: -6 dBs, 1k ohm RCA plug.

Horizontal Resolution: More than 320 lines (Black & White).
More than 240 lines (Colour).

Audio Frequency Response: 50 Hz- 10k Hz (3H mode).

Signal-to-Noise Ratio: Video: better than 45 dB.

Audio: better than 43 dB.

Operating Temperature: 41°F - 104°F (5°C to 40°C).

Relative Humidity: 35 - 85(%)

Dimensions: 16.7 (W) $\times$ 13.3 (D) $\times$ 3.3 (H) (in.)

425 (W) $\times$ 338 (D) $\times$ 84 (H) (mm).

Weight: 5.9 kg

Alarm Recording Time: Timed: 15 sec/30 sec/45 sec/1 min./2 min./5 min./10 min.

Manual: Until switched off.

Display format: 1 DATE LINE: (Day)-(Month)-(Year) (Hour) : (Minute) : (Second) (Alarm number)

2 DATE LINE: (Day)-(Month)-(Year) (Day of week) (Alarm number)

(Hour) : (Minute) : (Second) (Recording mode)

Timer program, User selection, and Alarm record time/Power failure time/Elapsed time.

Display position: 1 DATE LINE: Up and down, 2 DATE LINE: In any of the 4 corners.

Timer Programme: Daily start and stop time for one week.

Battery Backup: Lasts for more than 7 days.

Elapsed Time Indicator: The maximum of 10,000 hours.

CONNECTORS

SET Input: Screw terminal for starting alarm recording.

RST Input: Screw terminal for finishing alarm recording.

GND: Screw terminal for ground.

ALM Output: Screw terminal for output while alarm recording is under way.

CLK Output: Screw terminal for command camera switching.

CALL Output: Screw terminal for external warning device.

Rating:

ALM/CALL Active: "L" Level.

Non active: Open.

Max. Drive current 7mA DC.

Max. Voltage +24V DC.

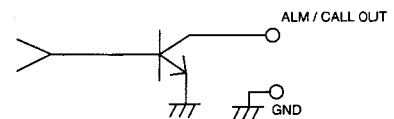
SET/RST

Active: When terminals are short-circuited or "L" level voltage applied.

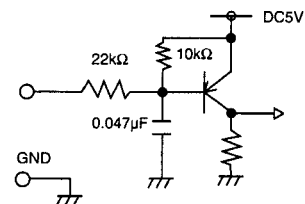
Non active: Open.

CLK

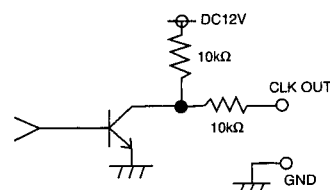
Recording:
A pulse of the frequency division ratio selected by user selection display.



<Interface circuit inside the VCR>



<Interface circuit inside the VCR>



<Interface circuit inside the VCR>

Weight and dimensions shown are approximate.
Design and specifications are subject to change without notice.

